**Remarks**

Claims 1-24 are pending in the application. Claims 1-24 are rejected. Claims 1, 10 and 16 have been amended. No new matter has been added. It is respectfully submitted that the pending claims define allowable subject matter.

Claims 1-22 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Levinson et al. (U.S. Patent 6,098,408) in view of Oshino et al. (U.S. Patent Application Publication 2004/0051984). Applicants respectfully traverse this rejection.

Levinson et al. describes a system for regulating reticle temperature in a microlithography system. In particular, a back plate 20 supports a reflective reticle 22, which includes an imaging pattern 24. The backplate 20 is part of a chuck assembly 28 for supporting and positioning the reticle 22 during a lithographic process (column 4, lines 33-37). A plurality of thermal electric coolers 30 are distributed on the bottom side of the backplate 20. The thermoelectric coolers 30 provide for heating and/or cooling the backplate 20 so as to regulate temperature of the reticle 22 (column 4, lines 46-50). The thermoelectric cooler 30 includes a matrix of thermoelectric elements 42 formed of n-type and p-type semiconductor material. The thermoelectric elements 42 are connected electrically in series and thermally in parallel. The thermoelectric elements 42 are interposed between two ceramic plates 48-50. The two ceramic plates 48, 50 define either a cold side 48 or hot side 50 depending on a DC voltage connection. With a positive DC voltage applied to an n-type thermoelement (not shown), electrons pass from a p-type thermoelement (not shown) to the n-type thermoelement and the cold side temperature will decrease as heat is absorbed (column 4, lines 51-64).

A temperature monitoring system 54 is also provided operatively coupled to the processor 60 and the reticle 22 (via the backplate 20). The temperature monitoring system 54 operates to monitor temperature of the reticle, preferably at a plurality of portions of the reticle 22. Temperature data relating to the reticle portions are provided to the processor 60 which employs this data in controlling the thermoelectric cooling system 50 to regulate reticle temperature (column 6, lines 9-15). Further, each of a thermistor TR is operatively

coupled to the processor 60 to provide the processor 60 with temperature data relating to the portion of reticle 22 that thermistor TR is monitoring, respectively. Based on the information received from the thermistors as well as other information, the processor 60 drives the voltage driver 110 operatively coupled thereto to control the thermoelectric coolers in a desired manner in order to regulate the temperature of the reticle 22 (column 7, lines 1-10).

Oshino et al. describes devices and methods for cooling optical elements in optical systems. In particular, a mirror includes an aspherical convex reflective surface 1a with the reverse ("rear") surface 1b of the mirror 1 being planar, and represents a surface at which no EUV light is incident and from which substantially no EUV reflects (paragraph 0105). A mirror-cooling device 10 is situated adjacent the rear surface 1b of the mirror 1. The mirror-cooling device 10 includes a first heat-receiving plate 3, a plate-cooling device 5 (comprising a heat pipe 4 and liquid-cooled body 6, the latter being an example of a fluid-cooled body), and a heat-proofing device 8 (heating device 7 and second heat-receiving plate 9). The first heat-receiving plate 3 is adjacent the rear surface 1b and side-circumferential surface (i.e., surfaces other than the reflective surface 1a) of the mirror 1 *without contacting* the respective surfaces. The first heat-receiving plate 3 is situated and configured so as not to interfere mechanically with either the mirror 1 or the mirror-holding device (not shown). Whenever the mirror 1 has experienced heating from absorption of a portion of the energy of incident EUV light, the heat radiates to the first heat-receiving plate 3 (paragraph 0106).

Claim 1 has been amended to more clearly recite the interconnection of the various components, namely that at least one of the heat dissipating plate and cold plate is connected to the thermo-electric device. Further, and with respect to the 103(a) rejection, claim 1 recites a temperature regulator that adjusts a temperature of an X-ray detector comprising "a heat dissipating plate in contact with an X-ray panel of the X-ray detector" and "a cold plate in thermal contact with the heat dissipating plate via a heat pipe." The combination of Levinson et al. and Oshino et al. fails to describe or suggest such a configuration. In particular, neither reference describes or suggests a heat dissipating plate in contact with an X-ray panel. Specifically, the Office Action admits that Levinson et al. does not describe the use of a heat dissipating plate in contact with an X-ray panel. Applicants further submit that Oshino et al. teaches away from such a configuration. Oshino et al. teaches that the heat

receiving plate is adjacent to, but not contacting, the rear surface of the mirror. Accordingly, Oshino et al., in contrast, teaches the exact opposite of the contact of a heat dissipating plate with an X-ray panel as recited in claim 1. In fact, Oshino et al. states that this non-contact is necessary so as to not interfere mechanically with the mirror of the mirror-holding device. Therefore, for at least the reasons set forth above, Applicants submit that claim 1 is patentable over the combination of Levinson et al. and Oshino et al.

Claims 2-9 depend from independent claim 1. When the recitations of claims 2-9 are considered in combination with the recitations of claim 1, Applicants submit that dependent claims 2-9 are likewise patentable over the combination of Levinson et al. and Oshino et al. for at least the reasons set forth above.

Claim 10, as amended, recites a method for regulating temperature of a medical X-ray detector comprising "providing a heat dissipating plate in contact with an X-ray panel of the medical X-ray detector and in thermal contact with a cold plate via a heat pipe with heat being transferred from the heat dissipating plate to the cold plate via the heat pipe." As discussed in more detail above, the combination of Levinson et al. and Oshino et al. simply does not teach a heat dissipating plate in contact with an X-ray panel of a medical X-ray detector. Further, neither of these references teach or suggest such a configuration for an X-ray panel of a medical X-ray detector. Both of these reference describe lithography systems and simply do not teach or suggest a configuration for use in a medical X-ray detector. Therefore, Applicants submit that for at least the reasons set forth above, claim 10 is patentable over the combination of Levinson et al. and Oshino et al.

Claims 11-15 depend from independent claim 10. When the recitations of claims 11-15 are considered in combination with the recitations of claim 10, Applicants submit that dependent claims 11-15 are likewise patentable over the combination of Levinson et al. and Oshino et al. for at least the reasons set forth above.

Claims 16, as amended, recites a system that adjusts a temperature in a X-ray detector comprising "a cold plate and a heat sink connected to the thermo-electric device, the heat sink in contact with an X-ray panel of the X-ray detector" and "at least one heat pipe thermally connecting the cold plate and the heat sink." As discussed in more detail above, the combination of Levinson et al. and Oshino et al. fails to teach or suggest such a

configuration. Therefore, Applicants submit, for at least the reasons set forth above, that claim 16 is patentable over the combination of Levinson et al. and Oshino et al.

Claims 17-22 depend from independent claim 16. When the recitations of claims 17-22 are considered in combination with the recitations of claim 16, Applicants submit that dependent claims 17-22 are likewise patentable over the combination of Levinson et al. and Oshino et al. for at least the reasons set forth above.

Claims 1-3, 5-7, 16-19 and 21-23 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over El-Husayni (U.S. Patent 5,940,780) in view of Oshino et al. (U.S. Patent Application Publication 2004/0051984). Applicants respectfully traverse this rejection.

El-Husayni describes a heat flow meter for measuring the thermal properties of a specimen. Specifically, an upper surface plate 16 is thermally coupled to an upper thermoelectric unit 30, which is thermally connected to an upper heat sink 32. Heat sink 32 is a flat plate with a set of conduits constructed to carry a circulating fluid. The fluid circulates in a closed fluid circuit between upper heat sink 32 and a lower heat sink 54. Similarly, the lower module includes a lower heat flux transducer 42, which is in thermal contact with specimen 2 and is thermally coupled to lower surface plate 44, made of a material with high thermal conductivity (column 5, lines 17-26). Thermocouples 46 and 48 measure the temperature of lower surface plate 44. Surface plate 44 is thermally coupled to a lower thermoelectric unit 50, which in turn is thermally coupled to lower heat sink 54. Lower heat sink 54, similarly as upper heat sink 32, includes a set of conduits for carrying a circulating fluid (column 5, lines 31-36).

In operation, a DC power supply 60 provides electric power to upper thermoelectric unit 30 and lower thermoelectric unit 50 connected in series. Both thermoelectric units 30 and 50 include several identical thermoelectric devices each consisting of pairs of an N-type semiconductor and a P-type semiconductor located between two ceramic substrates (a cold face and a hot face). Identical thermoelectric devices 30A, 30B, 30C, 30D, . . . , are wired in parallel and thermally coupled to a hot face 28 and a cold face 29. Similarly, identical thermoelectric devices 50A, 50B, 50C, 50D, . . . , are electrically connected in parallel and thermally coupled to a cold face 51 and a hot face 52. The DC power supply has an

adjustable output to regulate the temperature of the devices (column 5, lines 42-56). Further, a computer 80 runs an automation software, which enables automatic data acquisition and temperature control. Based on a control algorithm, computer 80 sends control signals to a Lawson 202 board (control 64 of FIG. 3A for differential temperature control), which, in turn, sends analog (0-5 Volt) control signals 88 and 89 to DC power supply 60 and heat exchange system 36, respectively (column 7, lines 34-40).

Claim 1 recites a temperature regulator that adjusts a temperature of an X-ray detector comprising "a heat dissipating plate in contact with an X-ray panel of the X-ray detector" and "a cold plate in thermal contact with the heat dissipating plate via a heat pipe." The Office Action admits that the primary reference, El-Husayni does not describe the use of a heat dissipating plate in contact with an X-ray panel. As discussed in more detail above, applicants submit that Oshino et al. teaches away from a configuration as recited in claim 1. Therefore, for at least the reasons set forth above, Applicants submit that claim 1 is patentable over the combination of El-Husayni and Oshino et al.

Claims 2, 3 and 5-7 depend from independent claim 1. When the recitations of claims 2, 3 and 5-7 are considered in combination with the recitations of claim 1, Applicants submit that dependent claims 2, 3 and 5-7 are likewise patentable over the combination of El-Husayni and Oshino et al. for at least the reasons set forth above.

Claims 16, as amended, recites a system that adjusts a temperature in a X-ray detector comprising "a cold plate and a heat sink connected to the thermo-electric device, the heat sink in contact with an X-ray panel of the X-ray detector" and "at least one heat pipe thermally connecting the cold plate and the heat sink." As discussed in more detail above, the combination of El-Husayni and Oshino et al. fails to teach or suggest such a configuration. Therefore, Applicants submit, for at least the reasons set forth above, that claim 16 is patentable over the combination of El-Husayni and Oshino et al.

Claims 17-19 and 21-23 depend from independent claim 16. When the recitations of claims 17-19 and 21-23 are considered in combination with the recitations of claim 16, Applicants submit that dependent claims 17-19 and 21-23 are likewise patentable over the combination of El-Husayni and Oshino et al. for at least the reasons set forth above.

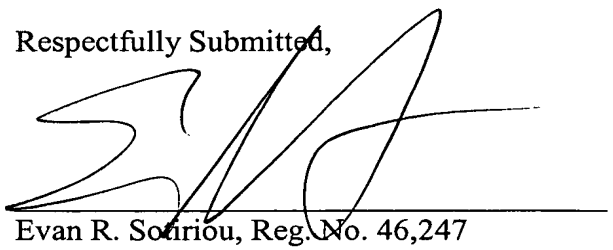
Claims 23 and 24 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Oshino et al. in view of Levinson et al. and further in view of Maydanich (U.S. Patent 6,370,881). Applicants respectfully traverse this rejection.

Applicants submit that claims 23 and 24 depend from claim 16 and that even from a cursory review of Maydanich, it is clear that Maydanich fails to make up for the deficiencies of Levinson et al. and Oshino et al. Therefore, when the recitations of claims 23 and 24 are considered in combination with the recitations of claim 16, and for at least the reasons set forth above, Applicants submit that claims 23 and 24 are patentable over Levinson et al. in combination with Oshino et al. and Maydanich.

Accordingly, for at least the reasons set forth above, Applicants respectfully request that the rejections of claims 1-20 under 35 U.S.C. § 103(a) be withdrawn and claims 1-20 allowed.

In view of the foregoing amendments and remarks, it is respectfully submitted that the prior art fails to teach or suggest the claimed invention and all of the pending claims in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited. Should anything remain in order to place the present application in condition for allowance, the Examiner is kindly invited to contact the undersigned at the telephone number listed below.

Respectfully Submitted,



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